

=> d his

(FILE 'HOME' ENTERED AT 08:18:25 ON 21 OCT 2002)
FILE 'REGISTRY' ENTERED AT 08:18:50 ON 21 OCT 2002

L1 1 S 7664-41-7
FILE 'CA' ENTERED AT 08:20:16 ON 21 OCT 2002
L2 29823 S (L1 OR AMMONIA OR NH3) (5A) (CONCENTRAT? OR LOADING OR ADSOR? OR
ABSOR? OR STORAGE OR STORING OR RESERVE)
L3 17 S L2(6A) (DETECT? OR DETERMIN? OR MEASUR? OR MONITOR? OR ASSAY? OR
ANALY? OR ASSESS? OR TEST? OR SENSE# OR SENSOR OR SENSING OR PROBE# OR
PROBING OR ESTIMAT? OR EVALUAT? OR QUANTITAT? OR QUANTIF?) AND SCR
L4 17 S L3 not SCR AND (IMPEDANCE OR THERMOCOUPLE OR PIEZO? OR SAW OR
SURFACE(1W)WAVE)
L10 33 S L3-4

=> d l10 bib,ab 1-33

L10 ANSWER 11 OF 33 CA COPYRIGHT 2002 ACS
AN 128:309773 CA
TI RF probe for monitoring composition of substances
IN Scott, Bentley N.; Shortes, Samuel R.
PA Phase Dynamics Inc., USA
SO U.S., 86 pp.
PI US 5748002 A 19980505 US 1996-592716 19960126
AB Systems, methods, and probe devices for electronic monitoring and
characterization using single-ended coupling of a load-pulled oscillator to
a system under test. The probes can be used to monitor moisture
absorption, microcryst. changes during setting of a cement slurry, fermn.
process, enzymic conversion of glucose to a glucose/fructose mixt.,
selective **absorption** of **ammonia**, and for food **anal.**

L10 ANSWER 15 OF 33 CA COPYRIGHT 2002 ACS
AN 126:296896 CA
TI Theoretical analysis of selective catalytic reduction catalysts
AU Bai, Hsunling; Chwu, Jong-Wen
CS Inst. Envir. Engrg., Nat. Chiao-Tung Univ., Hsin-Chu, 30039, Taiwan
SO Journal of Environmental Engineering (New York) (1997), 123(5), 431-436
AB A theor. anal. of the selective catalytic redn. (**SCR**) process is presented
to assist in the selection of a catalyst for efficient control of NOx from
flue gases. It is a 2-dimensional (2D) numerical model accounting for the
simultaneous effects of external diffusion and catalytic chem. kinetics.
Exptl. data of **SCR** performance employing different types of catalysts are
taken from the literature and **analyzed** for their **NH3 adsorption** const. and
effective-rate const. The catalysts' characteristics are then used to
predict their **SCR** performance. Good agreement is obtained between model
results and exptl. observations on the NO removals. The activities of the
catalysts are compared and strategies affecting **SCR** performance are
discussed. It is shown that the effective reaction rate of a catalyst is
the key parameter influencing its activity. The catalyst prepn. procedure
as well as the V2O5 content are important for detg. its NO removal rate.

L10 ANSWER 16 OF 33 CA COPYRIGHT 2002 ACS
AN 126:79022 CA
TI In situ ammonia analyzer for process control and environmental monitoring
AU Monlux, G.; Brand, J. A.; Zmarzly, P.; Walker, M.; Groff, K. W.; Fetzer, G.
J.; Goldstein, N.; Bein, F.; Richtsmeier, S. C.; Lee, J.
CS Monitor Labs, Inc., Englewood, CO, 80112, USA
SO Proceedings of SPIE-The International Society for Optical Engineering

(1996), 2835 (Advanced Technologies for Environmental Monitoring and Remediation), 236-247

AB An ammonia monitor designed for in situ smoke stack or exhaust duct applications is discussed here. A probe composed of a diffusion cell with a protected multipass optical measurement cavity provides the optical interaction with the sample. Other components of the system include signal processing electronics and an embedded PC104 computer platform. This instrument is useful in a wide variety of ammonia monitoring and process control applications, particularly ammonia-based NOx control technologies, such as selective catalytic redn. (SCR) and selective non-catalytic redn. (SNCR). The in situ design eliminates sample handling problems, assocd. with extractive anal. of ammonia, such as sample line adsorption and heated sample trains and cells. The sensor technol. exploited in this instrument is second harmonic spectroscopy using a near IR diode laser. Data collected during field trials involving both SCR and SNCR applications demonstrate the feasibility and robust operation of this instrument in traditionally problematic operating environments. The instrument can measure other gases by changing the wavelength, either by changing the diode operational set point or by changing the diode. In addn., with straightforward modification the instrument can measure multiple species.

L10 ANSWER 17 OF 33 CA COPYRIGHT 2002 ACS

AN 124:351153 CA

TI Experimental and theoretical investigations of the dynamics of the SCR-DeNOx reaction

AU Tronconi, E.; Lietti, L.; Forzatti, P.; Malloggi, S.

CS Dipartimento di Chimica Industriale e Ingegneria, Chimica del Politecnico, Milan, 20133, Italy

SO Chemical Engineering Science (1996), 51(11), 2965-2970

AB The kinetics of NH3-adsorption-desorption over model V2O5-(WO3/TiO2 catalysts) for the Selective Catalytic Redn. of NOx was studied by transient response techniques, and described according to rate expressions which account for heterogeneity of the catalyst surface. A dynamic math. model of the industrial SCR monolith reactor was derived, using the results of the transient study of NH3 adsorption as well as other independently estd. parameters. It has been successfully validated against lab. data concerning unsteady operation of com. SCR honeycomb catalysts, and applied to the simulation of typical transients of industrial SCR reactors. It is shown that the variations of the NOx emissions are always much faster than the dynamics of NH3.

L10 ANSWER 19 OF 33 CA COPYRIGHT 2002 ACS

AN 123:274487 CA

TI Impedance of zeolite-based gas sensors

AU Kurzweil, P.; Maunz, W.; Plog, C.

CS Dornier GmbH, Department FO, Friedrichshafen, 88039, Germany

SO Sensors and Actuators, B: Chemical (1995), B25(1-3), 653-6

AB Changes in cond. and capacitance of NaY- and NaPtY-zeolites allow concns. of butane, ammonia and other gases to be detd. by zeolite interdigital sensors. By impedance spectroscopy, hydrocarbon conversion can be sepd. from the effect of water, which appears in a different frequency range. NaY-zeolites show a moderate cond., which is due to the mobility of sodium and is influenced by the presence of gases adsorbed at the pore surfaces.

L10 ANSWER 20 OF 33 CA COPYRIGHT 2002 ACS

AN 122:88019 CA

TI Reducing NOx in diesel exhausts by SCR technique: experiments and simulations

TP1.A3

AU Andersson, S. Lennart; Gabrielsson, Paer L. T.; Odenbrand, C. U. Ingemar
 CS Dep. Chem. Reaction Eng., Chalmers Univ. Technol., Goeteborg, S-421 96,
 Swed.
 SO AIChE Journal (1994), 40(11), 1911-19
 AB Results of expts. are compared to simulations of the performance of V2O5/ γ -
 alumina **SCR** catalyst used to remove NO_x from diesel exhausts. The kinetic
 model is based on Eley-Rideal kinetics. Temp. programmed desorption of the
 NH₃ is used to **evaluate adsorption**/desorption parameters. Stationary
 expts. on a 3.6-dm³ honeycomb catalyst is used to evaluate kinetic rate
 parameters for the redn. of NO with NH₃. A dynamic test with a 12-dm³
 engine and 24.8-dm³ honeycomb catalyst is done with a stoichiometric
 injection of NH₃. The NO_x conversion is 52%, but during the freeway
 traffic the conversion reached 72%. The prediction of NO_x conversion is
 good, but there are some deviations for temp. and NH₃ slip.

L10 ANSWER 23 OF 33 CA COPYRIGHT 2002 ACS
 AN 119:78893 CA
 TI Surface and catalytic properties of vanadia-titania and tungsten oxide-
 titania systems in the selective catalytic reduction of nitrogen oxides
 AU Lietti, L.; Svachula, J.; Forzatti, P.; Busca, G.; Ramis, G.; Bregani, F.
 CS Dip. Chim. Ind. Ing. Chim. "G. Natta", Politec. Milano, Milan, 20133, Italy
 SO Catalysis Today (1993), 17(1-2), 131-9
 AB The chem. of the selective catalytic redn. (**SCR**) of NO_x with NH₃ over V2O5-
 TiO₂ and WO₃-TiO₂ catalysts was investigated by FTIR spectroscopy, temp.
 programmed desorption, temp. programmed surface reaction (TPSR), and
 catalytic activity measurements. Protonated and molecularly coordinated
 NH₃ species, assocd. with Broensted and Lewis acid sites, resp., and with
 different thermal stability, are obsd. upon NH₃ adsorption. WO₃-TiO₂ show
 stronger Lewis and Broensted acid sites than V2O5-TiO₂. Upon heating in NO
 atm., a reaction between adsorbed **NH₃** and gas-phase or weakly **adsorbed** NO
 is **monitored** by FTIR and TPSR measurements. The results indicate that
 V2O5-TiO₂ is significantly more active than WO₃-TiO₂, due to its superior
 redox properties. Monomeric vanadyls and meta-vanadate polymers are
 proposed as the active sites in the **SCR** reaction, the former sites showing
 lower reactivity. O is involved in the reaction and has a crucial role in
 detg. the reactivity of the catalysts.

L10 ANSWER 24 OF 33 CA COPYRIGHT 2002 ACS
 AN 117:75386 CA
 TI Denuder tube preconcentration and detection of gaseous ammonia using a
 coated quartz **piezoelectric** crystal
 AU Ali, Zulfiqur; Thomas, C. L. Paul; Alder, John F.; Marshall, Geoffrey B.
 CS Dep. Instrum. Anal. Sci., UMIST, Manchester, M60 1QD, UK
 SO Analyst (Cambridge, United Kingdom) (1992), 117(5), 899-903
 AB The feasibility of using a cylindrical denuder tube to sample gaseous NH₃+,
 followed by detection with a **piezoelec.** quartz crystal, was investigated.
 Gaseous NH₃ was sampled with a W oxide-coated cylindrical denuder tube and
 then thermally desorbed onto a **piezoelec.** quartz crystal coated with
 pyridoxine hydrochloride-Antarox CO-880. A linear calibration graph of
 peak area response vs. NH₃ concn. sampled was obtained for NH₃ concns.
 from 3.1-8.2 μ g/L. A **concn.** of 29 ng/L **NH₃** in air was **detected** with a
 signal-to-background ratio of 14:1 by obtaining an enrichment ratio of 900
 with the W oxide denuder tube.

L10 ANSWER 25 OF 33 CA COPYRIGHT 2002 ACS
 AN 116:222269 CA
 TI Temperature-programmed desorption/reaction and in situ spectroscopic
 studies of vanadia/titania for catalytic reduction of nitric oxide

AU Srnak, T. Z.; Dumesic, J. A.; Clausen, B. S.; Tornqvist, E.; Topsoe, N. Y.
 CS Dep. Chem. Eng., Univ. Wisconsin, Madison, WI, 53706, USA
 SO Journal of Catalysis (1992), 135(1), 246-62
 AB Temp.-programmed desorption (TPD) and temp.-programmed reaction (TPR) studies were conducted to probe the catalytic chem. of nitric oxide redn. by NH₃ on thin films of TiO₂, V₂O₃, and V₂O₃/TiO₂ at vacuum conditions, as well as on powd. catalysts under flow conditions. The activation energies and enthalpies of NH₃ desorption estd. in vacuum and powder TPD studies., resp., are comparable, consistent with nonactivated NH₃ adsorption. The enthalpies of NH₃ desorption range from ~18-26 kcal/mol, with the enthalpy increasing with decreasing V₂O₃ content. In situ IR measurements of the surface NH₃ coverages under reaction conditions for the selective catalytic redn. (**SCR**) of NO suggest that NH₃ adsorption on Lewis acid sites is stronger than on Broensted acid sites and **NH₃ adsorption** is not rate detg. for the **SCR** reaction. Significant amts. of adsorbed NO are not present in V₂O₃/TiO₂ surfaces under **SCR** reaction conditions. Vacuum and powder TPR studies indicate that the activation energy for the formation of N₂ from NO and NH₃ is ~20 kcal/mol, independent of whether the NO species is strongly adsorbed (under vacuum TPR conditions) or weakly adsorbed (under powder TPR conditions).

L10 ANSWER 26 OF 33 CA COPYRIGHT 2002 ACS

AN 109:162419 CA

TI Ammonia **surface acoustic wave** gas detector

AU D'Amico, A.; Petri, A.; Verardi, P.; Verona, E.

CS Ist. Acust. "O. M. Corbino", Cons. Naz. Ric., Rome, I-00189, Italy

SO Ultrason. Symp. Proc. (1987), (Vol. 1), 633-6

AB A **surface acoustic wave (SAW)** ammonia detector is described. The device consists of a **SAW** delay line fabricated on a STX-SiO₂ substrate, whose propagation path is coated with a selectively sorbent Pt film. Absorption and desorption of ammonia in the film, produce a change in the mass d. and in the elastic properties of the film which, in turn, cause a change in the **SAW** phase velocity. The change in velocity causes a shift in the phase at the output of the line which can be detected as a frequency shift when the line is configured in a **SAW** oscillator. The response of the device was investigated vs. both ammonia gas concn. in N and temp. for different values of the film thickness. Finally the use of differential structures, to reduce the device sensitivity to temp. fluctuations was investigated and results discussed.

=> log y

STN INTERNATIONAL LOGOFF AT 08:37:36 ON 21 OCT 2002

=> d his

(FILE 'HOME' ENTERED AT 09:03:02 ON 21 OCT 2002)

FILE 'REGISTRY' ENTERED AT 09:03:14 ON 21 OCT 2002

L1 1 S 7664-41-7

FILE 'CA' ENTERED AT 09:03:39 ON 21 OCT 2002

L2 29823 S (L1 OR AMMONIA OR NH₃) (5A) (CONCENTRAT? OR LOADING OR ADSOR? OR ABSOR? OR STORAGE OR STORING OR RESERVE)

L3 3425 S L2 (6A) (DETECT? OR DETERMIN? OR MEASUR? OR MONITOR? OR ASSAY? OR ANALY? OR ASSESS? OR TEST? OR SENSE# OR SENSOR OR SENSING OR PROBE# OR PROBING OR ESTIMAT? OR EVALUAT? OR QUANTITAT? OR QUANTIF?)

L4 457 S L3 AND CATALYST NOT SCR

L5 22 S L4 AND (IMPEDANCE OR THERMOCOUPLE OR PIEZO? OR SAW OR SURFACE (1W) WAVE OR CONDUCT? OR RESISTIV? OR ELECTRODE)

=> d 15 bib,ab 1-22

L5 ANSWER 7 OF 22 CA COPYRIGHT 2002 ACS
AN 122:321332 CA
TI **Sensor for determining** the gradient of **ammonia concentration** in waste gases
IN Schmelz, Helmut
PA Siemens A.-G., Germany
SO Eur. Pat. Appl., 13 pp.
PI EP 652435 A2 19950510 EP 1994-116919 19941026
US 5546004 A 19960813 US 1994-334860 19941104
PRAI DE 1993-4337663 19931104
AB The **concn.** of **NH3** is **detd.** on the basis of **cond.** in flue gas and exhaust gas streams to be contacted with **catalysts**, using sensors from TiO2 and ≥ 1 of WO3, MoO3, V2O5, and VxMoyO32-z where $x+y \leq 12$, $x, y \geq 1$ and $z \leq 1$.

L5 ANSWER 14 OF 22 CA COPYRIGHT 2002 ACS
AN 98:22869 CA
TI Measurement of acid site density on molybdenum sulfide
AU Hou, P.; Wise, H.
CS Solid State Catal. Lab., SRI Int., Menlo Park, CA, 94025, USA
SO J. Catal. (1982), 78(2), 469-72
AB The **catalyst** was subjected to NH3 pulses at 300 K in a microreactor system connected to a thermal **cond.** cell. The amt. of **adsorbed NH3** was also **detd.** by temp.-programmed desorption. After exposure to H2S/H2 mixts., 3 different Mo sulfide hydrosulfurization **catalysts** all showed marked increases in acid sites as S activity in the gas phase increased. All MoO3 was converted to MoS2 according to XPS and x-ray diffraction measurements. The H2 sorption capacity appears to parallel NH3 sorption capacity (twice as much NH3 is adsorbed as H2). Apparently, the NH3 reacts with surface sulfhydryl groups.

L5 ANSWER 17 OF 22 CA COPYRIGHT 2002 ACS
AN 84:127453 CA
TI Direct measurement of interaction energy between solids and gases. I. Heat of adsorption of ammonia on zeolite
AU Tsutsumi, Kazuo; Koh, Hong Qui; Hagiwara, Seiichi; Takahashi, Hiroshi
CS Inst. Ind. Sci., Univ. Tokyo, Tokyo, Japan
SO Bull. Chem. Soc. Jpn. (1975), 48(12), 3576-80
AB The differential heat of **adsorption** of **NH3** [7664-41-7] on synthetic zeolites was calorimetrically **measured** and the distribution of the surface acidity was discussed in relation to the catalytic activity for cumene-cracking as a function of zeolite compns. A newly designed app., a twin-**conduction**-type calorimeter equipped with a semiconductor thermoelement and an adsorption app., was used for the direct measurement of the differential heat of adsorption. The differential heat of adsorption of NH3 decreased with the increase in surface coverage, the acid site on the surface becoming stronger up to 27 kcal/mole for NH3-adsorption when the ratio of silica to alumina was higher and the content of exchanged ammonium ions was higher. The cumene-cracking reaction was effectively catalyzed by zeolites having such sites with heat of adsorption of NH3 exceeding 25 kcal/mole.

=> log y

STN INTERNATIONAL LOGOFF AT 09:09:35 ON 21 OCT 2002